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SAVINGS THROUGH PROPER SUPERVISION OF WEIGHTS, MEASURES AND STANDARDS

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Smith writes Jones three letters: the first expressing views on a technical subject; the second, offering certain commodities for sale; the third, a personal note remarking on the height and the weight of his first-born. These three writings would be absolutely unintelligible to Jones unless there were a basis of comparison; unless the quality and the quantity referred to definite standards; unless the money were standardized in quality and quantity and unless the weight and the height were in terms of recognized standards. With readily understood basic standards, Jones knows immediately what Smith means and understands him perfectly. Imagine the confusion and the waste of time, effort and money for Jones even to attempt to understand the three letters, let alone attempt an equitable transaction without standardization.

Every civilized, and therefore complex, scheme of government must, to a certain extent, regulate the traffic in commodities for the protection of itself as a purchaser of supplies and for the protection of the producer, the distributor and more particularly, the consumer. Such regulation or supervision necessarily means not only the establishment of standards but also seeing that the same are compiled with in reasonable limits. The most primitive scheme establishes standards of exchange of money, then makes the assumption that every individual has knowledge of detail and can protect himself. This principle of "Let the purchaser beware," does afford protection in a simple, small and primitive group of society. With the increasing complexity and expansion of society, specialists are developed and certain standards based on honest trade, custom and technical conditions must be established. The launcher of any commodity must be made responsible and the principle of "Let the seller beware" is still necessary. The launcher becomes the responsible specialist and the responsibility must be insisted on and enforced; either by duly appointed and trained agents of the national, state,

county or city government, or by agents of an organized trade society who enforce the regulation by rigid coöperation of those launching the particular commodity. Such enforcement cannot be equitably done except in a broad, economical spirit. It is very important to enforce the idea that it is not necessary to have any governmental regulation of standards that have been universally adopted and adhered to by custom, and any attempt to regulate such is merely providing for unnecessary positions at the expense of the public, and is no protection of the public.

Standards may be divided broadly into two classes, fundamental standards and commercial standards. The establishment of fundamental standards of quality and quantity is a physical or chemical research operation. The establishment of commercial standards is an economic operation with a utilitarian object, and may be based partly on the former. The attempt of the former to do the latter has always and will always be disastrous as has been so often demonstrated. Having fundamental standards of governmental uniformity throughout a nation necessarily saves time and effort, and, if there were universal fundamental standards among nations, there would be a still greater saving of time, effort and money. Such is the basis of the argument of those advocating the universal adoption of the metric system. It makes little difference what system it is, so long as a universal system of standards is adopted. Trade standards are standards in commerce and their establishment and their uniformity produce most immediate and direct saving to producer, distributor and consumer.

Specific illustrations of the saving of time, effort and money through standardization are numerous. For example in the matter of standardization of commercial weighing and measuring devices, the first official specifications for such devices issued in the United States were established by the Department of Weights and Measures of the State of New York, and they have since been copied with slight variations to suit local conditions by other states, by cities and by a federal government bureau. Some variations have been made to suit local conditions; others, like the federal government bureau, made some variations for the purpose of argument and are bad, as they are not based upon practical experience. The New York state specifications were based upon economic principles and upon experience, were consistent with the best trade and manufacturing practice,

were not arbitrary and were not founded on preconceived notions. The result has been that the consumers have been protected by having the weighing and measuring devices used in trade such as do not facilitate the perpetration of fraud.

This standardization of types, together with the requirement of the representation of how much is delivered, saves the purchaser in time and effort because he knows *how much* immediately, and saves him money because he has a basis of comparison. The dealer saves in effort and time because he purchases his weighing and measuring instruments on condition that they comply with those official specifications, and he saves in money because he knows that he will not have to waste time and he will not have to pay for unnecessary adjuncts. In ordering his supplies he knows that they will be delivered in known standard amounts. The manufacturer is on the same basis, and he has before him the standard specifications with which he must comply before he can make his goods. The whole effect of this establishment of uniformity in commercial weighing and measuring devices has been a coöperation and a clear understanding, and has discredited the unscrupulous. As soon as the latter were discouraged, the possibilities for fraud were reduced, and consequently, there was a saving in money to the honest dealer and to the consumer.

The associated lamp manufacturers were the first to recognize standards in incandescent electric lamps. These standards naturally drew comparisons. These comparisons ultimately gave the consumer the modern incandescent electric lamp which has saved the manufacturers and the consumers great amounts of money, giving more light per dollar than could possibly have been obtained ten years ago. The manufacturers of iron pipes and plumbers' supplies have recognized that the multiplicity of pipe diameters, sizes and parts has caused a great deal of worry and effort. Consequently, by mutual agreement, certain definite standards of pipes have recently been adopted which have eliminated a great economic waste heretofore prevalent. There has been and will continue to be, a consequent saving in money to the manufacturer, to the dealer and to the owner of a home. The standardization of screw threads and standard screws has been discussed for at least a hundred years. It was a general practice fifteen or twenty years ago to have a multiplicity of screw threads. Many manufacturers of machinery or instruments prided themselves on the

odd sizes of screw threads they used. Today, by mutual agreement between machine manufacturers, a great many sizes of screw threads are standardized so that a person need not any longer waste time, effort or money in selecting a machine screw for a certain purpose. He knows that when he orders certain sizes of screws they will exactly meet the requirements, and that there is no need of re-cutting or re-tapping. The standardization of the parts of railroad cars has made a very material reduction in waste and a material saving in time, effort and money. Twenty years ago, a car that was in any way damaged or had to be repaired required almost re-building; today wherever in the United States a car may be damaged or a part lost, the damaged or lost part can be immediately replaced, because the parts have been standardized.

As a final illustration: The state of New York passed a law, known as the Brooks law, requiring certain containers for fruit to be of standard size, and requiring that, in the selling of any commodity whatever, a representation be made of how much is sold. As a result of this legislation in New York state, Congress enacted a statute amending the pure food and drugs act, requiring that on foods in packages, a representation must be made of how much is contained in the package. The federal law is, of course, very much narrower than the New York state law. The immediate effect of the passage of these statutes will be that, by mutual agreement among manufacturers, certain containers will be standardized, in so far as this is practicable in the distribution of their goods. Such standardization following the requirement that a representation of "how much" be made, must start with the launcher of the container, and cannot, in sincerity and equity, be enforced through penalizing the person who has goods packed in unstandardized containers. The manufacturer of the container must, himself, be penalized. The standardization of packages and shipping containers is bound to be realized with a consequent great economic saving.

In all questions of standardization of a commercial nature, it must be borne in mind that the three parties which must be considered are the producer, the distributor, and the consumer; and the three elements that must be considered are whether such standardization will save time, effort and money.

In the matter of savings to the consumer, what has the establishment of the standards of weights and measures and an inspection

service accomplished? As the only available data on the results obtained by inspecting weights and measures are that of the state department of weights and measures of New York state and as this was the first state to have broad statutes on the subject, I will draw therefrom.

In 1907 and 1909 with no constructive or systematic inspection of weighing and measuring devices used in trade anywhere in the state, the averages for the state show that only 53 per cent of the scales, 48 per cent of weights, and 48 per cent of measures were correct; in other words half of the commercial weighing instruments in daily use were incorrect. The vast majority of these used showed an error, detrimental to the consumer, ranging from 3 to 10 per cent. At the same time, commodities put up from bulk and ready to be delivered were tested. Those tested showed that, approximately 40 per cent were correct, and 60 per cent incorrect.

Investigations in 1911, 1912 and 1913 made after the establishment of the weights and measures inspectional service in the state under state supervision, showed that 80 per cent of the scales, 84 per cent of weights, and 83 per cent of measures were correct. (These figures should be slightly higher, if the full results of 1913 are taken into account.) The prevailing inaccuracies in the instruments that were incorrect were not over 3 per cent. Goods ready to be delivered and weighed and measured from bulk showed that 75 per cent were correct.

The correctness of the commodities delivered is therefore roughly proportional to the correctness of the weighing and measuring devices used.

It must be noted that practically in no place was there any difference in price between correct weight or measure and short or incorrect weight or measure; the consumer pays as much for 14 ounces as he would for 16 ounces.

To summarize:

1st Instance No or very faulty inspection and poor standards			2d Instance Established inspection under state supervision and state specifications from commercial weighing and measuring de- vices	
	Per cent incorrect	Average percentage loss	Per cent incorrect	Average percentage loss
Scales.....	47	3 to 10	20	less than 3
Weights.....	52	3 to 10	16	less than 3
Measures.....	52	3 to 10	17	less than 3
Commodities.....	60	7	25	less than 3

Money loss is directly proportional to these shortages. This enormous, almost phenomenal, reduction is due solely and purely to the establishment of state supervision of weights and measures used in trade and the establishment of standard specifications for such weighing and measuring devices.

The above, then, irrespective of prices paid, represents the loss in dollars and cents eliminated, or in other words, the money saved to the consumer, due to the instruments alone. The former loss of 40 cents on every ten dollars has been reduced to the loss of not over $7\frac{1}{2}$ cents out of every ten dollars.

The instrumental side and the sale of bulk goods are only one phase of weights and measures or standards. Many and increasing numbers of commodities are sold in packages. Package goods are increasing in number for simple economical reasons, but at the same time, such package goods have been used in many cases deceptively to create an idea of exclusiveness and superiority. Thus the advertising and other selling expenses have been increased beyond a reasonable limit, where advertising should be used for the purpose of increasing total sales, in order to reduce the unit manufacturing cost. This has worked to the detriment of the consumer and to the detriment of the dealer in many cases.

The state of New York, as cited above, has passed a law that all goods will have to be marked to indicate how much is delivered and all package goods will have to be marked to indicate how much is contained therein. The state of New York is the only state which has a statute to cover all kinds of commodities. This gives consumers a ready means of comparing goods which they could not have without such marking.

Take a few illustrations. (1) Many cereals formerly put in two-pound packages and retailed at 10 cents have now shrunk to twenty ounces at 10 cents. The same kind of cereals of other brands now sell thirty-two ounces for 9 cents. (2) Fourteen ounce prints of butter in one store were sold for 36 cents, sixteen ounce prints in another store were sold for 38 cents—the latter, of course, is very much cheaper per pound, but without a representation being required, the consumer does not know. The honest dealer, as well as the consumer, is defrauded. (3) A package of Lion Brand Wool (16 ounces), costs \$1.50; a package of Pansy Brand Wool, (14 ounces) costs \$1.50. Formerly, the latter was not marked, the outside of the package was the same. It was deceptive and a case of moral fraud and an injustice to the honest manufacturer. By knowing the contents, the consumer could readily save two ounces out of sixteen, or $12\frac{1}{2}$ per cent—considerably more than savings at bank interest, far better than farm mortgages. (4) A roll of ribbon (10 yards) costs 35 cents; a roll of unmarked ribbon ($9\frac{1}{2}$ yards) costs 35 cents. (5) Twine has been sold by some concerns by net weights, namely, selling twine. Others have sold it by gross weight, namely selling twine and wrapping at the price of twine. The excuse is made that the wrapping is more expensive than twine, but twine is the commodity desired and the wrapping does not serve the purchaser even if it were made of gold-leaf. (6) Seeds have been sold by liquid measure, this latter giving in dealing a direct loss of 15 per cent. (7) Picture cord when marked 25 yards or 75 feet generally sells for 10 cents. Picture cord selling for ten cents but unmarked will be often found to measure only 55 feet; a loss of 20 feet or $26\frac{2}{3}$ per cent.

These illustrations can be increased almost indefinitely, and it can always be borne in mind that by requiring a definite representation, there is no increase in apparent price but an actual decrease in actual price.

The New York state law requiring the marking and the representation of quantity, takes away the premium on dishonesty, and enables the consumer to buy intelligently. Disregarding hardware, dry goods, drugs, twine, paper, notions, seeds, coal etc., one can get a rough estimate of the annual savings to the consumer in the state in the past five years due to definite standards of apparatus and quantity on a few of the necessities of life.

This is stated in tabular form as follows:

Commodity	How formerly sold	How now sold due to changed conditions	Gain in quantity per unit to the consumer, due to changed conditions	Total gain in money due to standardized weights and measures in quantity in the state per annum
Flour.....	Gross weight	Net weight	Up to 16 oz. in 48 lbs.	\$ 500,000
Bread.....	The loaf	Net weight	Up to 3 oz. in 1 lb.	3,000,000
Cereals.....	The package	Net weight	Up to 6 oz. in 1 lb.	500,000
Small Fruit...	The box or basket	Net standard dry measure	Up to 25%	500,000
Meat.....	Gross weight	Net weight	Up to 3% on 1 lb.	5,000,000
Potatoes.....	Short measure	Net weight	Up to 20%	2,000,000
Milk.....	The bottle	Standard measure	Up to 5%	2,000,000
Sugar.....	Gross, partly	Net weight	Up to 5 %	1,500,000

This estimate is extremely conservative and the amount of \$15,000,000 saved annually to the people of the state by having standardized weights and measures and quantities through an inspectional weights service under state supervision, is the minimum amount. When to these are added the hundreds of items that are used in the field, in the factory, in the store, in the office, in the hotel, and in the home, the actual amount saved to the consumer is many times increased. To this, of course, should be added the savings in time and effort, which means in reality an additional saving in money.

In the above I have gone into considerable detail as to the savings to the consumer. Similar figures borne out by facts brought forth in investigations can be shown to be savings for the producer, be he manufacturer or tiller of the soil, and can be shown for the distributor, be he wholesale or retail dealer.